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Bednarek et al.(10) **Pub. No.: US 2021/0170299 A1**(43) **Pub. Date: Jun. 10, 2021**(54) **PRESSURIZED VAPOR CYCLE LIQUID
DISTILLATION**(71) Applicant: **DEKA Products Limited Partnership**,
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W. McGill**, Woodstock, GA (US)(21) Appl. No.: **17/013,807**(22) Filed: **Sep. 7, 2020****Related U.S. Application Data**(60) Continuation of application No. 16/247,125, filed on
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B01D 35/12 (2006.01)**B01D 45/08** (2006.01)**C02F 1/04** (2006.01)**C02F 1/16** (2006.01)**F04C 19/00** (2006.01)**F28D 9/00** (2006.01)**B01D 29/52** (2006.01)**B01D 29/66** (2006.01)**B01D 29/96** (2006.01)**B01D 3/00** (2006.01)(52) **U.S. Cl.**CPC **B01D 1/2887** (2013.01); **Y10S 203/08**
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(57)

ABSTRACT

Embodiments of the invention are directed toward a novel pressurized vapor cycle for distilling liquids. In some embodiments of the invention, a liquid purification system is revealed, including the elements of an input for receiving untreated liquid, a vaporizer coupled to the input for transforming the liquid to vapor, a head chamber for collecting the vapor, a vapor pump with an internal drive shaft and an eccentric rotor with a rotatable housing for compressing vapor, and a condenser in communication with the vapor pump for transforming the compressed vapor into a distilled product. Other embodiments of the invention are directed toward heat management, and other process enhancements for making the system especially efficient.

